sized city filter plants. The cities in the neighborhood of Troy supply good illustrations of the different modern methods of water purification.

The *Bulletin* of the American Mathematical Society states that during the Easter vacation of 1912 an extensive course in mathematics and physics for advanced teachers will be held at Göttingen under the direction of Professor F. Klein.

Dr. C. Rankiär has been appointed professor of botany, and director of the Botanical Gardens at Copenhagen.

Dr. Gilbert T. Morgan, assistant professor of chemistry at the Imperial College of Science and Technology, South Kensington, and junior hon. secretary of the Chemical Society, has been appointed to the chair of chemistry at the Royal College of Science, Dublin, vacant by the retirement of Sir Walter Noel Hartley, F.R.S.

Dr. Theodor Boveri, professor of zoology at Würzburg, has been called to Freiburg.

DISCUSSION AND CORRESPONDENCE

NUMBER OF STUDENTS PER TEACHER

To the Editor of Science: It appears to me that the only correct way to determine the average number of students handled per teacher in any school is to divide the number of student hours per week by the number of teacher hours per week.

For example, let there be 15 teachers and 300 students. This does not mean that on the average one teacher instructs 20 students in a recitation or class. Suppose each student takes 15 hours per week, and that each teacher instructs only 12 hours per week. There are therefore 15×12 classes per week for 300×15 students, since each student appears in 15 classes. The average number of students in each class is therefore

$$300 \times 15 \div 15 \times 12 = 25.$$

In general, therefore, the average number of students which each instructor has to handle in one recitation is the number of student hours divided by the number of teacher hours, in one week.

The average number of hours per week required of each student and each teacher, viz., the number of student-hours and teacher-hours per week divided respectively by the number of students and teachers, are also important numbers in respect to the average work required of students and teachers.

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FUNDULUS AND FRESH WATER

"*Fundulus* and Fresh Water" in your issue of December 29, 1911, recalls some experiences I have had with these fishes in transferring them from salt and brackish to fresh water. *Fundulus heteroclitus* may be so transferred more safely, the less degree of salinity there is in the water whence they were derived. Most of my specimens came from the Hackensack River and its creeks, varying from the saline Newark Bay to the almost entirely fresh water at Little Ferry and at the heads of the creeks. While very few of those transferred from salt water directly to fresh survived the sudden change, an increasing number survived of those gradually transferred in the course of a week or two, through a number of changes of water. My records show that such fishes lived from four to six months, up to two years; one lived over three years. I never succeeded, however, in making a successful transfer of the highly colored breeding males.

Fundulus diaphanus, though known almost entirely as a fresh water species, when taken from salt water also offers difficulties in transferring, thus showing that successful transfer in all cases appears to be a matter of very gradual accomplishment.

Fundulus majalis I never succeeded in transferring, no doubt because of its being a purely marine species.

Cyprinodon variegatus also can be gradually accustomed to a change of water, but being practically only an anadromous fish during breeding time does not very long survive.

It is possible that these cyprinodonts being great rovers can ill bear small quarters and this may be one reason for their shortlivedness in captivity, as compared with the quieter cyprinids for instance.